Application Serial No. 10/540,739   PATENT
Reply to office action of February 22, 2008   Docket: CU-4285

REMARKS/ARGUMENTS

Reconsideration is respectfully requested.

Claims 1-18 are pending before this amendment. By the present amendment,

claims 1-2, 5-11, 14, and 16-18 are amended. No new matter has been added.

In the office action (page 2), claim 6 is objected to as containing informalities.

Claim 6 has been amended in as suggested by the examiner, and withdrawal of the

rejection is respectfully requested.

In the office action (page 2), claim 18 stands objected under 35 U.S.C. § 112, ¶2

as being indefinite. The examiner notes that claim 18 was not complete and was open

ended (page 2).

As best understood by the applicants, it appears that some type of scanning error

may have occurred at the USPTO in processing the papers of the present application as

claim 18 was filed in whole on June 24, 2005. The applicants have reached this

conclusion after checking the files at our end including the papers filed with the USPTO

as well as the USPTO's records in the PAIR system which provides claim 18 in whole.

Nevertheless, the applicants respectfully thank the examiner for examining the entire

claim 18 according to the corresponding PCT application as noted in the office action

(page 2). Claim 18 in whole (without markings) is also included in the Listing of Claims

in this paper.

In the office action (page 3), claims 1-17 stand rejected under 35 U.S.C. § 103(a)

as being obvious over U.S. Patent No. 7,209,571 (Davis). The "et al." suffix is omitted

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in a reference name.

The presently claimed invention is directed to a method and apparatus for describing three-dimensional image data and retrieving the three-dimensional image data based on how it was described. Conventionally, a three-dimensional image data has been searched by presenting an image object to an image retrieval system, that is, by searching based on combinations of color and texture and by using descriptors for the motions of the camera capturing the data. However, these conventional methods cannot reliably provide the three-dimensional image data for applications and display apparatuses, because the classification structure and descriptors are insufficient to provide accurate data retrieval.

The present invention discloses an apparatus, method, and computer readable medium for describing the three-dimensional image data, as well as an apparatus, method, and computer readable medium for retrieving three-dimensional image data described in the aforementioned apparatus, method, and computer readable medium. Specifically, the presently claimed invention uses descriptors for describing three-dimensional image data at an acquisition procedure, a representing procedure, and a display procedure (specification page 12, line 25 to page 13, line 5). The aforementioned procedures are unique to the three-dimensional image data defined in the present invention. More specifically in the present invention, the three-dimensional image data "give an effect of multi-view points and a cubic effect which two-dimensional image data and computer graphics cannot provide" (specification page 13, lines 18-21). As described in the present invention, all three-dimensional image data passes through an acquisition unit, a representing unit, and a display unit (specification page 14, lines

18-23). Accurately classifying the three-dimensional image data at each step/unit allows for quicker and more precise retrieval.

The present invention discloses three types of descriptors, e.g., an acquisition descriptor, a representing descriptor, and a display descriptor, for adequately describing the **unique** characteristics of the three-dimensional image data (specification page 14, line 24 to page 25, line 1). The acquisition descriptor describes the acquisition procedure and the hardware used to capture the three-dimensional image, e.g., an omni-directional camera, a depth abstraction camera, a stereoscopic monoview camera, a stereoscopic mutli-view camera, and a monoscopic multi-view camera (specificaion page 15, lines 2-8; FIG. 2). The representing descriptor describes the representing procedure and defines how image data is either processed or un-processed. This descriptor is important because typical 2D encoding tools such as MPEG and JPEG are not suitable for information acquired in the acquisition step via a camera such as an omni-directional camera (specification page 15, lines 9-18; FIG. 3). Finally, the display descriptor describes the display procedure and the apparatus upon which the three-dimensional image data is appropriate for, e.g., a monoscopic display and stereoscopic display and subgroups thereof (specification page 16, lines 5-13; FIG. 4).

The display descriptor serves an important role as certain three-dimensional image data cannot be viewed on certain types of display apparatuses. Therefore, it is important the display descriptor be set correctly in order to allow for accurate searching and retrieval of three-dimensional image data that is appropriate for the display apparatus that is to be displayed upon.

Davis does **not** disclose the descriptors of the present invention. Davis is

directed to encoding and authenticating of data associated with certain media signals.

The examiner alleges that Davis teaches an apparatus for describing three-dimensional

image data (page 3). However, Davis only mentions three-dimensional image data in

two areas of the specification (Davis col. 2, lines 23-27; col. Col. 17, lines 1-2). Neither

of these areas of the specification remotely begins to talk about an acquisition,

representing, or display descriptor for three-dimensional data. Rather, the entire

disclosure of Davis is directed towards 2D image capture utilizing digital cameras (Davis

col. 3, line 44 - col. 5, line 48). Specifically, Davis describes associating data with an

image in three ways, i.e., steganographic encoding of data in the image, storing the

data within the image file but outside the image, and storing the data outside the file and

associating it with the image via a link encoded in the image (Davis col. 9, lines 30-38).

The examiner first alleges that Davis teaches the descriptors of the present

invention in col. 11, line 15 - col. 12, line 5 (page 3). The section cited by the examiner

is merely a laundry list of data types without giving adequate description of each data

type. The examiner alleges that the Davis teaches the display descriptor of the present

invention as the "view region" of Davis (page 3). However, the "view region" of Davis

and the display descriptor of the present invention are not the same. The "view region"

of Davis merely describes the picture format of a 2D image captured by a digital

camera.[1] This is unlike the three-dimensional display descriptor of the present invention

that indicates what type of display apparatus the three-dimensional image data can be

displayed upon. The "view region" as alleged by the examiner, does not indicate

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[1] See About the Advanced Photo System,
http://www.kodak.com/cluster/global/en/consumer/APS/redBook/aboutSystem.shtml

whether a display apparatus is capable or not of displaying the data, but merely the picture format and therefore cannot teach the three-dimensional display descriptor of the present invention. It is further worth noting that at the time Davis was filed, it could not have contemplated the descriptors of the present invention. The entire disclosure of Davis is directed towards the description of 2D image data. Those aspects of Davis, which it attempts to associate to other media signals, are generic and universal. However, the descriptors described and claimed in the present invention are directed specifically to three-dimensional image data uniquely. To read Davis as envisioning every type of possible data tag for all the media signals merely mentioned in Davis would read overly and unfairly broad.

The examiner also alleges that Davis teaches the registering of the three-dimensional image data endowed with the descriptors (page 3). Specifically, the examiner points to col. 12, lines 49-57 of Davis. However, the cited section of Davis is substantially different from the claimed language of the present invention. Davis teaches embedding a digital watermark in an image that would act as a reference for associated data. Upon uploading of an image, the data would be forwarded to a metadata server (Davis col. 12, lines 49-57). That is, the three-dimensional image data **and the descriptors** does not get registered to a database, but in Davis, **only the metadata** gets forwarded. This is important aspect of Davis as it supports its objective of supplying persistent steganographic data and metadata servers as described in col. 12, line 10 – col. 13, lines 6. This is further supported in Davis in the section entitled "Access to Just Metadata (Independent of the Picture)" that describes how storing the metadata **independent** of the image data allows for quicker storage and retrieval (Davis col. 14,

lines 17-26).

The applicants respectfully point out to the examiner that the interpretation of

claim 3 and 12 alleging individual descriptor databases is incorrect. The claimed

language of claim 3 and 12 clearly recites (emphasis added):

>   —an individual descriptor **database** that stores the acquisition descriptor..., the
>   representing descriptor..., and the display descriptor--

It is clear from claim 3 that multiple databases, each one being for a unique descriptor,

is not being claimed. Rather, an --individual descriptor database-- that houses all the

descriptors.

Regarding claim 4, 7, 13, and 16, the applicants respectfully **disagree** with the

examiner that Davis teaches an integrated descriptor. The presently claimed invention

describes an integrated descriptor that may represent a set of descriptors (specification

page 18, line 13 - page 19, line 25). The integrated descriptor is defined as a single

descriptor for a combination of three abstracted descriptors in the descriptor database

(specification page 19, lines 23-25). However, there is nothing in Davis to teach a single

descriptor for the combination of multiple descriptors. Rather, the examiner alleges that

because "various combinations of 'data types' [may] be embedded into [an] image," that

this discloses an integrated descriptor. There is absolutely no support that Davis

discloses a single integrated descriptor embodying multiple individual descriptors.

In conclusion, Davis teaches neither the three-dimensional image data

acquisition descriptor, nor representing descriptor, nor display descriptor of the present

invention. Further, to read Davis as encompassing any and every data type for every

media signal is to read Davis overly broad. Davis' disclosure is directed primarily to

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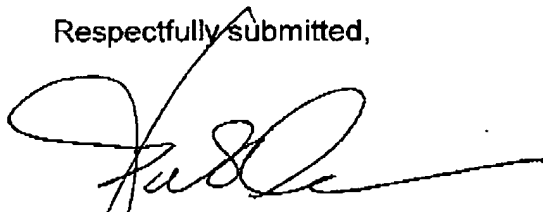
watermarked 2D images and does not disclose in any way the three-dimensional image data descriptors of the present invention. Therefore, Davis cannot teach independent claims 1, 5, 8, 10, 14, and 17 for at least the reasons stated above. Additionally, Davis does not even remotely suggest an integrated descriptor as disclosed by the present invention. Rather Davis merely suggests that multiple descriptors maybe used, but not that a single descriptor may be used in place of multiple descriptors. Accordingly, Davis does not teach the dependent claims 4, 7, 13, and 16.

For the reasons set forth above, the applicants respectfully submit that claims 1-18 pending in this application are in condition for allowance over the cited references. Accordingly, the applicants respectfully request reconsideration and withdrawal of the outstanding rejections and earnestly solicit an indication of allowable subject matter.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns, the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully submitted,

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